

# Exhibit “A”



# Consulting

Property Loss and Personal Injury Incidents

ELECTRICAL FAILURES

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de Luca Levine, LLC  
Three Valley Square Suite 220  
Blue Bell, PA 19422

FIRES AND EXPLOSIONS

Re: **Parvez and Razia Yazdani**  
**Date of Loss: February 25, 2013**  
**2004 BMW R 1150 R Motorcycle**

ELECTROCUTION/SHOCK

January 29, 2016

EQUIPMENT FAILURES

## Introduction

FURNACES/ BOILERS

On February 25, 2013, a fire occurred at the home of Parvez and Razia Yazdani located at 1200 Windsor Road, Mechanicsburg, Pennsylvania. The fire occurred at approximately 3:45 PM while a 2004 BMW R1150 R motorcycle was warming up/idling in the garage. IEI Consulting was asked to assist in determining the cause of a fire and how the motorcycle caused or contributed to this incident.

WORKPLACE INJURIES

BIOMEDICAL DEVICES

## Materials Reviewed

I reviewed the following documents:

ANIMATION & GRAPHICS

- Plaintiffs' Complaint;
- Hampden Township Fire Report;
- Plaintiffs' Interrogatories and Request for Production of Documents Addressed to BMW North America, LLC;
- BMW North America, LLC's Responses to Plaintiffs' discovery requests and accompanying documentation;
- R1150 R Rider's Manual;
- Service Records for the subject motorcycle;
- Deposition Transcripts and exhibits of Parvez Yazdani dated 9/22/15;
- Deposition Transcript and exhibits of Mark Yeldham dated 12/17/15;

FAILURE MODE TESTING

EXPERT TESTIMONY

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- Report of Bradley A. Schriver dated December 20, 2015;
- Photographs taken by Bradley A. Schriver.

## **Background**

In April 2011, Parvez Yazdani purchased a used 2004 BMW R1150 R motorcycle in Boston, MA. Mr. Yazdani kept the motorcycle in his garage and during the wintertime he would periodically warm it up by letting the engine run for 7 to 9 minutes. (Yazdani Dep. p. 14-16, 64). On February 25, 2013, Mr. Yazdani started the engine of the BMW R 1150 R motorcycle to let it warm up. (Yazdani Dep. p. 64). Mr. Yazdani got distracted and went back into his house he believes to answer the phone. (Yazdani Dep. p. 66). Mr. Yazdani heard the smoke detector activate and he proceeded to the garage where he observed flames coming from the engine of the motorcycle. (Yazdani Dep. p. 69, 70). The motorcycle was on its side stand. (Yazdani Dep. p. 70). He attempted to remove the motorcycle out of the garage, but there was oil on the floor and the motorcycle slipped. (Yazdani Dep. p. 69, 70). Mr. Yazdani was able to move the motorcycle about 6 to 7 feet before it fell close to his BMW automobile. (Yazdani Dep. p. 71-72). Mr. Yazdani went back into his house to get his keys to his BMW car to move it out of the garage. (Yazdani Dep. p. 72). Mr. Yazdani's neighbor, Trevor Cantanese, contacted 911. (Yazdani Dep. p. 72). Mr. Yazdani was uncertain exactly how long he left the motorcycle running and testified it was about 30 minutes, but could have been longer. (Yazdani Dep. p. 77).

## **Investigation**

Bradley Schriver, CFEI, CVFI, of Schriver Fire & Explosion Investigations, LLC, inspected the Yazdani home and motorcycle. Mr. Schriver prepared a report dated December 20, 2015. Mr. Schriver eliminated all other competent ignition sources and concluded "that the BMW R1150R was the ignition source of this fire" and "all other potential competent ignition sources within the garage had been examined, considered and eliminated as a cause of the fire." (Bradley Schriver's Report). Please see Mr. Schriver's report for his specific conclusions and opinions.

On June 4, 2013, I inspected the subject motorcycle at T-Masters body shop in Hammonton, NJ. Mark Yeldham representing BMW NA was present for this inspection.

The subject remains of the BMW motorcycle were observed. For the purpose of this report, left side is the side of the motorcycle while sitting on the motorcycle.

The inspection was non-destructive and consisted of the inspection/identification of components of the motorcycle retained from the loss location.

The fuel tank, engine and exhaust were still attached to the frame; the other components/parts were separated from the frame. The area of the oil sight glass was inspected. The oil sight glass and seal were compromised.

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Many of the ancillary components of the motorcycle were consumed and/or deformed due to the intensity of the fire. Most of the non-ferrous engine components were consumed and/or deformed as a result of the temperatures generated during the event. There is more damage to the left side of the motorcycle than the right side, based upon the remaining components. This is consistent with Mr. Yazdani's testimony of where he first observes the fire on the motorcycle.

The exhaust pipes were affected from the heat but were intact. The remains of the engine sustained significant damage. The valve covers, the pulley and timing chain assemblies were affected and as well as the induction system were damaged. Based upon the significant engine damage and Mr. Schriver's analysis of the loss location, I concur with his findings. The motorcycle was the origin and cause of the fire.

On December 12, 2013, an attempt was made to radiograph the exhaust components of the subject BMW motorcycle. Due to the construction of the components as well as the limits of the equipment we were unable to conduct the radiographic exam successfully. As a result, it was determined the exhaust components, be removed in order to examine the internal condition of the components.

A subsequent inspection was conducted on May 7, 2014 at Insurance Evidence Services. Mr. Yeldham was also present for this inspection. The muffler assembly was removed to inspect the inside of the exhaust components. The interior of the exhaust components did not reveal the cause of the incident.

## **Discussion**

The subject BMW motorcycle is a twin cylinder, horizontally-opposed boxer type, fuel injected, air/oil cooled engine. This means the engine uses air/oil rather than coolant to provide heat dissipation throughout the engine. This engine is colloquially referred to as an "oil head". This is in reference to oil flowing over the heads, rockers and valve assembly. The air-cooled boxer motor design was most notably used in Volkswagen's Beetle for years. Unlike a water-cooled engine as the name implies; an air-cooled engine uses outside air and engine oil to transfer and dissipate heat generated from the engine during the normal use of the engine.

Air-cooled engines will often utilize an engine cooling fan to assist in the heat dissipation of engine heat when the air flow is not sufficient to dissipate the heat (sitting in traffic, idling, etc.) In addition, air-cooled engines will also utilize an engine oil cooler to help in the removal of the heat from the engine oil. Without these additional components, the engine and engine oil as well as other associated components will increase their operating temperatures while idling.

The subject BMW R 1150 R motorcycle is equipped with an oil level sight glass, instead of a dip stick, so that users can check the motorcycle's oil level. The oil level sight glass is mounted to the lower left crank case of the motorcycle by a seal ring. According to BMWNA documents, the oil level sight glass is a composite material, Grilamid TR 70, which is heat resistant up to 165°C (329°F). According to BMWNA documents, in March 2000, the material of the seal ring was changed from NBR, to a more heat resistant material, FPM, which is a viton-type material.

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The oil level sight glass is in close proximity to the exhaust system and exposed to increase temperatures when the engine is running. The oil sight glass is located in extremely close proximity to the engine exhaust (header) pipe. The location of the oil level sight glass, being near the exhaust pipe obviously exposes it to increased temperatures. This in addition to the increased engine oil temperature(s) which would be achieved during idling when the heat of the oil is not being dissipated; creates a failure scenario for the seal ring or the sight glass.

According to BMW NA documentation, in another similar thermal incident involving a BMW motorcycle, a simulation was run on an exemplar 2004 R 1150 R. The simulation recorded the increase in the 2004 R 1150 R's engine temperature over a period of 21 minutes while the motorcycle was stationary and on the side stand. The test was stopped after 21 minutes and the temperature of the left cylinder head (where the oil level sight glass is located) reached 302°F. This is close to the heat deflection temperature or heat distortion temperature of BMW's oil level sight glass, which is 329 °F according to BMW NA's materials. Mr. Yazdani testified that he left the motorcycle running for approximately 30 minutes. (Yazdani Dep. p. 77). This would have been sufficient time for the engine temperature to reach 329°F, the heat deflection temperature or heat distortion temperature of BMW's oil level sight glass causing its failure. Furthermore, the consistent thermal cycling/fatigue of the seal and sight glass over years of repeated usage may lower the heat deflection point creating the failure at an earlier point.

If the oil level sight glass or ring seal fails, hot engine oil will leak from the engine onto the hot exhaust pipes. Mr. Yeldman testified that when the polymer sight glass reaches the "heat deflection point"(deformation point) of 329°F oil will leak from the sealing surface or the polymer itself and splash onto the left side header exhaust pipe. (Yeldman Dep. P. 111,112) Mr. Yeldman testified that it is the increase in engine oil temperature that precipitates the failure of the sight glass either from the polymer Grilamid TR 70 or the seal itself.

This will result in a fire. A failure of the oil level sight glass corroborates Mr. Yazdani's testimony that he observed flames coming from the engine of the motorcycle and saw oil from the motorcycle on the garage floor. (Yazdani Dep. p. 69, 70).

Further, Mr. Yazdani testified the motorcycle was on its side stand. (Yazdani Dep. p. 70). With the motorcycle on side stand, the oil in the crankcase would cover the oil level sight glass and allow more oil to leak from the sight glass onto the exhaust pipe as discussed above. If it were on the center stand the oil would sit level in the engine crankcase, using the side stand shifts the oil onto the left side of the crankcase where the sight glass is leaking. All consistent with Mr. Yazdani's testimony.

It is evident from the warning in the Rider's Manual that BMW NA was aware of the risk of fire if the subject motorcycle was allowed to idle for an extended period of time.

The Rider's Manual provided with the subject R 1150 R motorcycle warns of potential fire damage resulting from extended idling as follows:

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Page 51: Do not allow the engine to idle unnecessarily of for prolonged periods – Risk of overheating or fire. Ride away immediately after starting the engine.

Page 60: Do not warm up the engine with the motorcycle at a standstill – risk of overheating or fire! Ride away immediately after starting the engine. To avoid overheating the air cooled engine and possible damage as a result, avoid even short warm-up periods at a standstill. Avoid high engine speeds after a cold start.

It is my opinion that is customary and foreseeable that operators of equipment and motorcycles usually allow engines to warm up prior to operating their equipment or motorcycles to prevent stalling and allow engine components to be properly lubricated with warm oil

In addition, there have been internet reports of BMW air-cooled motorcycles that have caught fire while idling during traffic stops. As a result of this known issue, BMW offers an auxiliary fan, BMW part# 17112317705, this kit is often referred to as the “police fan”. This kit is offered as an option to the motorcycle.

It does not appear this fan was ever installed on the Yazdani motorcycle. Clearly, because of the known failure of the oil level site glass/sealing material due to reasonably expected idling during traffic and/or other road hazards this “optional” fan kit should be a standard factory installed component.

BMW could and should have designed its R 1150R motorcycle to avoid this fire hazard by either using the auxiliary fan identified above, a dip stick instead of an oil level sight glass and/or using a liquid-cooled engine instead of an air cooled engine.

## **Conclusion**

Based on the information presented above it is the conclusion of IEI’s investigation, to a reasonable degree of scientific certainty, that this fire was caused by an overheating condition from the motorcycle being left running in a stationary position, which caused the failure of the oil level sight glass or sealing material allowing hot engine oil to escape/spray/splash onto the exhaust header pipe and ignite.

In addition, the “optional police fan kit” should have been installed on the subject motorcycle as a standard equipment when manufactured/sold. It is clearly evident based upon the history of overheating of this motorcycles and usage within traffic or extended idling periods, this is a foreseeable event. Installing this BMW fan kit would have most likely prevented this incident.

Should additional information be provided, I reserve the right to modify, revise or supersede my opinions and conclusions.

01.29.16

Re: Yazdani

Sincerely,

A handwritten signature in black ink, appearing to read "mzazula", with a long horizontal flourish extending to the right.

Michael Zazula  
Engineering Consultant  
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Exhibit A